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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/666,626	09/18/2003	David R. Mckala	58446US002	9235

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EXAMINER

CHUO, TONY SHENG HSIANG

ART UNIT PAPER NUMBER

1745

DATE MAILED: 10/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/666,626

Applicant(s)

MEKALA ET AL.

Examiner

Tony Chuo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 September 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) 13-29 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 and 30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>3/1/04, 9/26/05</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Group I, claims 1-12 in the reply filed on 9/29/06 is acknowledged. Claim 30 is rejoined with group I since claim 30 depends from claim 1 and is drawn to a product. The traversal is on the ground(s) that the claims of Groups I and II are so interrelated that a search of one group of claims will reveal art to the other. This is not found persuasive because the search for the product and the method claims would require different fields of search that would result in a serious burden on the examiner. The requirement is still deemed proper and is therefore made FINAL.

Information Disclosure Statement

2. The information disclosure statements (IDS) submitted on 3/1/04 and 9/26/05 were filed on 3/1/04 and 9/26/05. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

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4. Claims 1-4, 6, and 30 are rejected under 35 U.S.C. 102(a) as being anticipated by Barton et al (WO 03/058743). The Barton reference discloses a gas diffusion backing comprising a porous carbon paper impregnated with a first fluorinated polymer as a first layer and a microporous layer of a second fluorinated polymer which contains carbon particles wherein the first fluorinated polymer is hydrophobic and the second fluorinated polymer is hydrophilic (See page 7, lines 8-19). In addition, it also discloses a hydrophobic layer that has a thickness of about 180 microns and a hydrophilic layer that has a thickness of about 1 to 100 microns (See page 14, lines 18-19 and page 17, lines 27-30). Further, it also discloses an intermediate layer between the carbon paper and the microporous layer (See page 8, lines 19-22). It is noted that the specific endpoint of 1 micron for the range of thickness of the hydrophilic layer is disclosed in the reference. With respect to claim 30, Figure 2 of the reference shows a layer of fuel cell electrode catalyst "7" in contact with the hydrophilic surface layer "5" (See page 15, lines 15-32).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barton et al (WO 03/058743). The Barton reference is applied to claims 1-4 for reasons

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stated above. However, the reference does not expressly disclose a third layer comprising a carbon fiber construction coated with a fluoropolymer. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Barton gas diffusion backing to include a third layer comprising a carbon fiber construction coated with a fluoropolymer that is identical to the second layer because duplication of parts was held to have been obvious (*In re Harza* 124 USPQ 378 (CCPA 1960)). Moreover, the reference discusses an intermediate layer (See page 8, line 18-22).

7. Claims 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barton et al (WO 03/058743) as applied to claim 1 above, and further in view of Nagamori et al (JP 11-045733). However, the Barton reference does not expressly disclose a hydrophilic surface layer comprising functional groups containing Si, a metal, or Si and O. The Nagamori reference discloses a hydrophilic layer "6" of a gas diffusion electrode that contains SiO_2 and Al_2O_3 as the ingredient of a hydrophilic property (See paragraph [0028]). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Barton gas diffusion backing to include a hydrophilic surface layer comprising functional groups containing Si, a metal, or Si and O in order to maintain the optimum moisture content of the electrolyte membrane and improve the performance of the fuel cell.

8. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Barton et al (WO 03/058743) as applied to claim 1 above, and further in view of Segit et al (WO 02/22952). However, the Barton reference does not expressly disclose a roll good comprising the fuel cell gas diffusion layer. The Segit reference discloses a fuel cell

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electrode substrate that is flexible and can be made as roll goods (See Abstract).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Barton gas diffusion backing to include a roll good comprising the fuel cell gas diffusion layer in order to manufacture the gas diffusion layer by a continuous, high volume manufacturing process that permits wide variability in different properties of the gas diffusion layer.

9. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Barton et al (WO 03/058743) as applied to claim 1 above, and further in view of Taniguchi et al (US 6083638). However, the Barton reference does not expressly disclose a hydrophilic surface layer that is present on less than all of the hydrophobic second layer, according to a pattern. The Taniguchi reference discloses a hydrophilic layer "203" that is present on less than all of the hydrophobic layer "202", according to a pattern (See Figure 6(b) and column 12, lines 49-53). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Barton gas diffusion backing to include a hydrophilic surface layer that is present on less than all of the hydrophobic second layer, according to a pattern in order to prevent water from collecting in the gas flow channels while maintaining proper moisture levels in the electrode layers.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tony Chuo whose telephone number is (571) 272-0717. The examiner can normally be reached on M-F, 8:30AM to 5:00PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's trainer, Susy Tsang-Foster can be reached on (571) 272-1293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TC

A handwritten signature in cursive script, reading "Susy Tsang-Foster".

**SUSY TSANG-FOSTER
PRIMARY EXAMINER**